

Alex D. Felker
Vice President-Technology
Time Warner Telecommunications

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FEDERAL COMMUNICATIONS COMMISSION
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T I M E W A R N E R

August 3, 1993

Ms. Donna R. Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

RE: Ex Parte Filing
Personal Communications Services
GEN Docket No. 90-314;
Emerging Technologies
ET Docket No. 92-9 ✓

Dear Ms. Searcy:

Enclosed are an original and one copy of a document addressing the bandwidth requirements for new personal communications services. On this date, I provided a copy of the enclosed document to John Williams during a meeting in which we discussed the subject of the enclosure. Please associate the material with the above-captioned dockets.

Sincerely,

Alex D. Felker

Enclosure

PCS Assignment Bandwidth of at Least 40 MHz Is Required To:

- Support Vocoder and Data Rates Competitive with Existing Wire/Wireless Nets
- Facilitate Prompt Service Availability via Band Sharing with Incumbents
- Lower Subscriber Costs
 - Increases trunking efficiency
 - Decreases investment in frequency reuse
- **Establish Coverage/Capacity Parity Between 2 GHz PCS and 800 MHz Cellular**

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30 MHz Does Not Facilitate PCS/Microwave Co-Existence

- **Microwave channels are generally 10 MHz**
 - Receiver passbands frequently wider than 10 MHz
 - Adjacent channels generally vacant
- **40 MHz pairing (20 X 20 MHz) allows access to some spectrum immediately**
- **30 MHz pairing (15 X 15 MHz) can result in**
 - Competitors jointly negotiating with microwave licensee
 - Inability to use any portion of assignment in certain congested areas

DIFFERENCES IN PHYSICAL PROPERTIES OF 800 MHZ AND 2 GHZ

- Effective antenna apertures ($1/f^2$)
 - Results in 7.25 dB greater path loss at 2 GHz
 - Cannot be compensated with higher gain antennas
- Greater building attenuation
- Greater received signal variance at 2 GHz
 - For equivalent coverages, implies greater average received power

If the effects of these properties are not offset, 2 GHz PCS systems will require at least 4 times as many cell sites as 800 MHz cellular systems for comparable levels of coverage & capacity

CELLULAR/PCS PARITY

TO PUT PCS COVERAGE & CAPACITY ON PAR WITH CELLULAR REQUIRES:

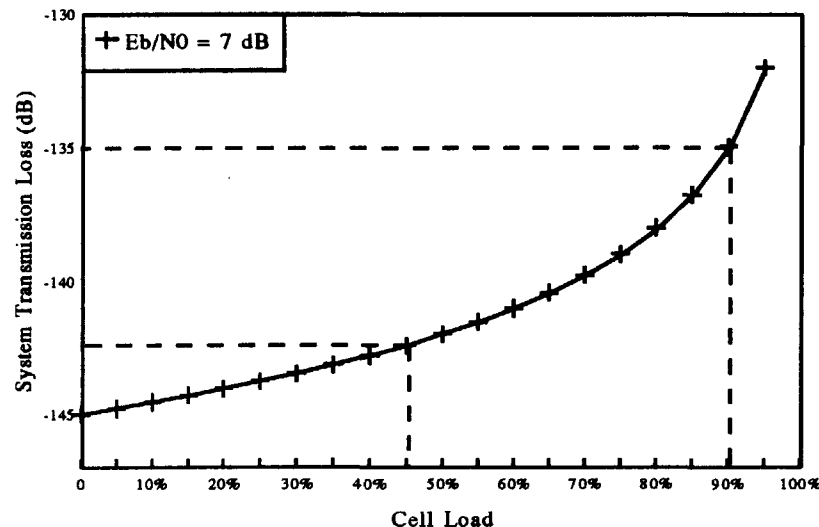
- Equivalent numbers of base stations and comparable power levels
- Sufficient spectrum to make PCS traffic handling capacity comparable to cellular

Q-CDMA PERMITS COVERAGE/CAPACITY TRADEOFF

For a given radiated power level:

- Coverage may be increased by reducing number of active voice channels
- Number of voice channels may be increased by reducing coverage

Q-CDMA SYSTEM TRANSMISSION LOSS IS A FUNCTION OF LOADING



To obtain coverage and capacity parity with cellular's 25 MHz, PCS must have at least 40 MHz of CLEAR spectrum

$$T(r) = \text{CNR}_{\min} + (N_0 W)_c - p_t - 10\log(1-X)$$

Where,

X = Loading Factor

Source: The CDMA Network Engineering Handbook
Vol. I, Qualcomm, Inc; November 23, 1992

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